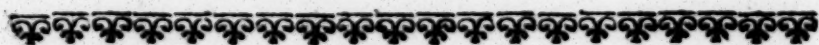


A
DISSERTATION
ON THE
Ancient and Noted Doctrine
OF
Revulsion *and* Derivation.



[Price One Shilling and Six-Pence.]



DISSERTATION

ON THE

Ancient and Modern Medicine

OF

Revolution and Derivation.



[Price One Shilling and Six Pence.]

DISSERTATION

O N T H E

Ancient and Noted Doctrine

O F

Revulsion *and* Derivation :

W H E R E I N

The Absurdity of the Principles, on which the Notion of Revulsion was originally founded, is evidently demonstrated, and the immediate Consequences of Blood-letting plainly prov'd, both from the Laws of the Circulation, and the obvious Effects of this, and several other spontaneous and artificial Evacuations, in the Cure of Diseases, to be the emptying, exhausting those Vessels in particular, that more immediately communicate with the Orifice ; and consequently that all Drains, whether by Bleeding, Issues, Setons, &c. should be made near, as they conveniently can, to the Part affected.

By GILES WATTS, M. D.

*At BATTLE in SUSSEX.**Errabat in multis rebus Antiquitas,*

CICERO.

Non tam Auctoritatis in disputando, quam rationis momenta querenda sunt.

CICERO.

L O N D O N :

Printed for GEORGE KEITH, at the Bible
and Crown in Gracechurch-Street.

M.DCC.LIV.

DISSERTATION

ON THE

History and Antiquities of the

Revolution of 1776

IN THE

State of New York
By
JAMES M. SMITH
OF THE
Bar at New York
Author of
"The History of the
Revolution of 1776 in
the State of New York"
New York:
J. B. Lippincott & Co.
1876

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the State of New York"

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MDCCCLXXVI

T H E

P R E F A C E.

THE following Sheets, in all Probability, had not been publish'd so soon, had it not been for the unlucky Case of an Apoplectic Patient, that happen'd in February last, in treating which I was accused of *Male-Practice*, and that solely for pursuing the two obvious Indications of exhausting, and breaking the Impetus of the Circulation from, the Vessels of the Encephalon, by bleeding in the superior System of Blood-Vessels, and of inviting the Blood in larger Quantities, and determining its Impetus, on the more remote Parts, by injecting stimulating cathartick Clysters, &c. applying Vesicatories and Sinapisms on the inferior Extremities: A Practice, which as to me it seem'd the most likely to relieve the Part affected, so it will, I

presume, appear in the Course of the following Pages sufficiently rational to the Reader.

The Doctrine of Revulsion and Derivation, at least this last, is, so far as we can judge, as old as Medicine itself; and notwithstanding 'tis very evident, that the ancient Practitioners were greatly divided in their Opinions on this Subject, some asserting that Bleeding exhausts the Blood-Vessels adjacent to the Orifice, while others as warmly maintain'd, that it rather invites the Blood in extraordinary Quantities into, and consequently overloads such contiguous Vessels; yet from Galen's Days, the last of these Opinions has, generally speaking, been received almost as indisputably true; and therefore Bleeding in a Part remote from that affected has been look'd on as the most likely Means of relieving such Part.

Thus we find it was (and indeed still is) a Maxim religiously observ'd by the Generality of Practitioners in Medicine, either to defer Bleeding in, or near to, the Part indisposed, 'till Blood had been drawn from some distant Part, or else to neglect it altogether: A Practice which, however agreeable to, and consistent with, the last mention'd Opinion, is, doubtless, supposing the first to be true, very irrational, and extreamly prejudicial to the Success of Physick in general, since the Patient is hereby either totally depriv'd of the Benefit of a
most

most efficacious Means of Cure, or, at least, so long, 'till there is no further Occasion for its Use.

The Question in hand then, and that indeed a Matter of no small Importance to the Practice of Physick, is, what are the immediate Effects of Bleeding on the Vessels nearly communicating with the Orifice? It was with a View to determine this Point, that the following Reflections were penn'd, and if they shall in any wise conduce to the Illustration of this Matter, whether it be solely by Means of the Arguments therein advanc'd, or of inciting some one of greater Abilities, to execute what I have only attempted, I shall have gain'd my Ends as an Author; since I am only concern'd, that the Practice of this salutary Art, as in many other Respects, so particularly in this Point of an Election of Vessels in Blood-letting, is evidently defective, and far, very far, from being arriv'd at that Certainty, and Perfection, which has, by many its of Professors, been so ardently, alas! so vainly wish'd for.

It is very surprizing, that, notwithstanding the Circulation of the Blood has been now discover'd a great while, and many other extraordinary Discoveries and Improvements made in physical Knowledge in general, particularly in Anatomy, Hydrostaticks, Hydraulicks, &c. the Effects of Blood-letting, with regard to depleting, or over-charging
the

the Blood-Vessels contiguous to the Orifice, are not yet determin'd; and this, indeed, is so much the more extraordinary, as this particular Subject has a near and intimate Connection with mathematical and mechanical Knowledge, the Study of which has been so industriously prosecuted, and warmly recommended, by many of our greatest Physicians, as the only Means of arriving at any tolerable Degree of Certainty in Practice: How far an intimate Acquaintance with these particular Branches of physical Knowledge may have contributed to the Illustration of those medical Subjects, to which they have been applied, I shall not take upon me to determine; that this particular Point can't be decided without, at least, a Smattering of them, is sufficiently evident to all, who have a tolerable Knowledge of the Circulation.

Now as the Ancients were, to mention no other Particulars, entirely unacquainted with the real Course of the Blood, a Circumstance which even their most strenuous Advocates must acknowledge, it is very unreasonable for us to be still bias'd by them in a Question, of which they could not possibly be tolerable Judges, as being entirely destitute of proper Data from which to draw their Conclusions; yet so it is, that we are extreamly loth to part with any Maxim, that carries with it the Sanction of Antiquity, be it never so absurd and obviously repugnant to Common Sense and Reason;
and

and I question (with due Reverence to the Ancients, as the Inventors of this useful and salutary Art be it spoken) but this unreasonable Respect for (a) Antiquity, this entire Confidence, this implicit Faith, that has been universally plac'd in the ipse dixit of Hippocrates, Galen, &c. as it has been one of the greatest Obstacles to the Improvement of Medicine in general, so it has in a particular Manner with Respect to this Point, the Discussion of which we have taken in Hand.

The Ancients are, certainly, not without their Merit, not only as the Founders, but likewise as the Improvers of the Ars Medendi; they have accurately describ'd every of those Diseases with which they were acquainted, have given us many excellent Precepts with regard to their Treatment, and have deliver'd down to us several extreamly useful Observations with regard to the critical Terminations of Fevers in general, and by this Means enabled us not only to make pretty certain Prognosticks of their Exit, but likewise frequently to assist Nature in her salutary Endeavours to expell the morbid Matter; but alas! as they were entirely ignorant of the many excellent Truths,
which

(a) Among the many remarkable convincing Proofs of this Circumstance, we have a very notorious Instance of this Sort in the Gentleman (*Massarias*) who did not scruple to declare, he had rather err with his favourite Author *Galen*, than be in the Right with any body else.

which the Industry of later Times, and especially of the last Century, has brought to Light, so their Theory of, and Reasoning on, the Animal Economy, the Nature of its Disorders, &c. is extremely defective and erroneous, not to say often absurd and ridiculous: If then, from the Notions they entertained concerning the Distribution of the Blood-Vessels, Motion of the Blood, &c. I can demonstrate the Maxims, on which they founded their Doctrine, relating to bleeding near to, or at a Distance from, the Part affected, to be extremely erroneous and inconsistent with the Laws of the Circulation, and many other Properties of the Human Body, and that it is altogether impossible for the Mass of Blood to be attracted towards the Orifice in Blood-letting, as they imagin'd, I hope the World will not deem me guilty of having endeavoured to confute their Notions, and derogate from their Credit, merely to satisfy a capricious or contradicting Humour, especially when I am endeavouring to establish in their Room an Hypothesis, which as it is more agreeable to the Laws by which our Fluids are circulated, so probably it may, in some Measure, conduce to the better Success of the Practice of Medicine in general.

A
DISSERTATION
O N T H E

Ancient and Noted Doctrine

O F

Revulsion *and* Derivation, &c.

THE Ancients, though they have repeated their Rules and Precepts, relating to revulsive and derivative Evacuations, in almost every Page of their Writings, and especially *Galen*, (to whom chiefly we are oblig'd for the present prevailing Notions on this Subject) have notwithstanding made little or no mention of the Arguments on which this Doctrine was first built ; however this be, from the Notions they entertained concerning the proximate Cause of almost every Disorder, their Custom of opening particular Vessels in particular Disorders, the Definitions they have left us of the Terms, Revulsion and Derivation, together

B

gether with some other Circumstances relating to this Subject, with which their Writings acquaint us, one may collect a pretty satisfactory and consistent Account of the Principles, on which it was originally founded.

In the first Place, with Regard to the Cause of Disorders, it is very notorious, that they attributed them in general, but more especially those attended with Inflammation, Pain, Tume-faction, &c. to a Flux of Humours on the Parts affected; of Blood with a Mixture of Bile in an Erysipelas; of Pituita or Phlegm, in an Œdema, & sic de cæteris; a (a) Phlegmon or common Inflammation was ascrib'd to Blood flowing universim (*i. e.* from every Side) on the affected Part. We may likewise observe, that they made a grand Distinction between the different Stadia of such Disorders; whether they were (b) forming, or already form'd; whether the Humours were on the flow to, or already firmly impacted in, the Part affected, and the Fluxion at an End; and according as one, or the other, of these Circumstances attended the Disorder,

(a) Sanguine igitur optimo ac mediocrem crassitudinem obtinente ad particulam aliquam universim fluente, atque ob multitudinem conculcato, vehemens dolor arripit hominem, &c. hæc quidem passio totius generis nomen accipit, atque inflammatio nominatur. GAL.

(b) In fieri vel in facto.

Disorder, they (c) form'd their different Intentions of Cure by revelling or deriving: But of this Particular more hereafter.

The next Consideration that offers, is that of their opening particular Vessels in particular Disorders: now if we consult their Writings on this Point, we shall find, they always gave the Preference to such Vessels, as they imagined to be (d) distributed to the Parts affected, and this with a View the better to take off any Surcharge of Humours from such Parts: Thus *Hippocrates*, after having given us a Description of some of those, which he terms the (e) largest of the Blood-Vessels, and demonstrated their Connection with the Spine of the Back, in their Course to the Thighs, Legs, external Ankles, and Feet, adds the following practical Remark, (f)

B 2

“ We

(c) *Fluentium adhuc humorum antispasis, i. e. Retractio, eorum autem quæ jam membrum obsederunt, derivatio medela est. GAL. de Art. Cur. ad Gl. Lib. ii.*

(d) 'Twas for this Reason that opening of the exterior Vein of the Arm was appropriated to Disorders of the Head, &c. of the internal to those of the noble or vital Parts. And hence the first was afterwards term'd the Cephalic, and the last the Basilic.

(e) *Αἱ παχύλαται τῶν φλεβῶν. De Offium Naturâ.*

(f) *Δεῖ οὖν φλεβολομίας ἐπὶ τῶν ἀλγυμάλων τῶν ἐν τῷ πωτῶ, καὶ ἐν τοῖσιν ἰχθύοις, ἀπὸ τῶν ἰγνῶν ποιέεσθαι, καὶ ἀπὸ τῶν σφυρῶν ἐξάγειν. Ibidem.*

“ We ought therefore in Pains of the Back and
 “ Hips to bleed in the Hams and external
 “ Ankles :” And ’tis evidently for the same
 Reason, that he orders, immediately after, the
 Veins of the Ham, and internal Ankle, to be
 opened in Pains of the Loins and Testicles :
 And indeed (g) *Galen*, who is universally allow’d
 to have understood the *Hippocratic* Doctrine bet-
 ter than any other Author, not only illustrates
 the following similar Precept of that Author,
 relating to the Administration of Blood-letting
 in a Pleurisy, (h) “ If there be Pain in the Cla-
 vicle, or Heaviness in the Arm, or round the
 Breast, or above the Diaphragm, ’tis of Service
 to open the internal Vein of the Elbow,” by Ar-
 guments deduc’d from the intimate Communi-
 cation, which he supposes to interceed between
 this Vein, and the Parts above specified ; but
 likewise expressly says, (i) “ It was a Rule with
 “ him to endeavour, especially in acute Diseases,
 “ to exhaust that particular Part, which hap-
 pen’d

(g) Vide de vict. Ration. in Morb. Acut. Comment. II.

(h) Ἄλλ’ ἢν μὲν σημαίνει ἢ ὀδύνη ἐς τὴν κλίδα, ἢ ἐς τὸν
 βραχίονα βάρος, ἢ περὶ μαστὸν, ἢ ὑπὲρ τῶν φρενῶν, τὰμνεῖν
 ἀρήγει τὴν ἐν τῷ ἀγκῶνι φλέβα, τὴν ἔσω De Vict. Rat. in
 Morb. Ac.

(i) Nos vero partem eam, quæ phlegmone obsidetur, tum
 celeriter, tum, quam cæteras partes, magis, in acutis præfer-
 rim morbis, vacuare contendimus. In Lib. de Vict. Rat.
 in Morb. Ac. Comment. II.

“ pen’d to be loaded with the Inflammation.”
 A further Demonstration, that the grand Indication they had in View in Blood-letting, was to take off any Surcharge of Liquors from the Part affected, may be collected from their Doctrine of Evacuating κατὰξιν, or *e directo*: Now this Term, which *Galen* renders by the Word κατὰξιν, seems to imply a direct, *i. e.* such a Course of Vessels from one Part to another, as establishes an intimate Communication between them: And (*k*) informs us, that this Circumstance is of such extreme Consequence to the Patient, “ that whenever an Hæmorrhage happens in the same Direction with the Part affected, it is extremely beneficial; but, if otherwise, it is so far from being serviceable, that it sometimes does hurt: For (adds he) neither a Flux of Blood from the Right Nostril in Disorders of the Spleen, nor from the Left in those of the Liver, are of any Manner of Service: But (says he) a Cupping-Glass applied to the right Hypochonder, immediately restrains an Hæmorrhage of the right Nostril, and *vice versa*.” And he no less strictly enjoins the Observation of the same Rule in bleeding in Hæmorrhages, Pleurifies, &c. (*l*) “ In Disorders of the Right Side of
 “ the

(*k*) De Cur. Rat. per Sang. Mifs. Cap. xv.

(*l*) Si quidem in parte dextrâ locorum muliebrium passio fuerit, a dextra manu, aut crure detraxeris sanguinem: si

“ the Loca Muliebria, (says the same Author)
 “ you are to bleed in the right Hand or Foot;
 “ but in those of the left Side, in the Extre-
 “ mities, which are in the same Direction with
 “ the Part affected. For what *Hippocrates* terms
 “ *καὶ ἔξω*, is according to Direction, we are
 “ then to open the internal Veins; since these
 “ are nearer to, and more in a Direction with,
 “ the affected Parts. Thus in an Inflammation
 “ of the Spleen, open the internal Veins of the
 “ left Hand; and in that of the Liver, the in-
 “ ternal ones of the Right. (m) But in Dis-
 “ orders of the Extremities, make your Eva-
 “ cuations from their respective Fellows.” And
 from hence it is evident, that they did not, in
 the Application of this Term, attend to the
 Circumstance of the disorder'd Parts being si-
 tuate on the same Side with those, from whence
 the Evacuations were made, but rather to that
 of their being mutually connected by the Inter-
 vention of a direct Course of Blood-Vessels be-
 tween

vero in sinistrâ, a membris, quæ illis in directo sunt. Quod
 enim ab ipso *Hippocrate* *καὶ ἔξω*, dicitur, hoc ipsum est,
 secundum rectitudinem. Interiores autem incidere venas
 oportet: hæ enim viciniore, magisque e directo sunt pa-
 tientibus membris. Nam, si splene inflammationem pa-
 tientis, sanguinem vis evacuare, interiores in manu sinistrâ
 venas secato, et si hepate, eadem ratione in dextrâ. GAL.
 de Art. Cur. ad Gl. Lib. II. Cap. ii.

(m) Patientibus vero extremis membris, a conjugibus
 evacuatio facienda est. Ibid.

tween them : For surely, bleeding in one Arm or Leg, for the Relief of the other, can be call'd evacuating *καὶ ἔξιν* on no other Account, than that of their respective Vessels arising directly from the same common Trunks ; a Circumstance, of which their Anatomical Knowledge, (indifferent as it was) could not however fail of informing them. And indeed, (n) *Galen* tells us, that *Hippocrates* applies this Term to the Breadth, as well as the Length of the Body. From what has been said then on this Head, we may see that they made it their chief Care to bleed in those Vessels, which were suppos'd to have a close Communication with the affected Parts.

Hippocrates, tho' look'd on as the Inventor of *The Doctrine of Revulsion and Derivation*, has notwithstanding given us but a very inaccurate and superficial Account of it : He has indeed, expressly made use of these (o) Terms, given us an obscure (p) Precept or two, concerning revelling and deriving, and left us several Passages, relating

(n) Ex processione, i. e. *καὶ ἔξιν*, semper pro ex directo ponit, aliquando per longitudinem corporis, aliquando per latitudinem. In Lib. de Fract. Com. III.

(o) Παροχέλευσις ἐς κεφαλὴν, ἐς τὰ πόδια, ἢ μέλαινα πέποι ἢ ἀνίστασις ἐπὶ τοῖσιν ἄνω, καὶ ἄνω, ἐπὶ τοῖσι κατω.
De Humorib.

(p) Παρχελεῖν ὑπεξάντα. ἀνίστασθαι ἀνίστα. De Morb. Vulgar. Lib. VI. Sed. vii.

relating to the opening particular (q) Vessels in particular Disorders, and to the (r) bleeding near to, and at a Distance from, the Parts affected ; but has, by no means, deduc'd from his Notions on these Points any regular uniform Method of Proceeding, peculiarly adapted to the Cure of Disorders in particular. This was a Work reserv'd for his Successor *Galen*, and which indeed he has carefully executed : For however obscure, and sometimes even contradictory, the various Passages *Hippocrates* has left us on this Subject, may seem, as they now lie scatter'd up and down in his Works ; his Commentator *Galen*, has so clearly and copiously explain'd, and fully reconcil'd all seeming Contradictions between them, as from the whole, to form a set of regular, and consistent practical Rules, relating to revulsive and derivative Evacuations of all Sorts, and to the election of Blood-Vessels in particular Disorders, which have been almost chiefly

(q) Τῷ ὁπισθεὶ κεφαλῇς ὀδυνωμένῳ, ἢ ἐν μέσῳ τῳ ἔρῃ φλέψι
τμηθεῖσα, ὠφέλησεν. In eodem Loco.

(r) Ἀλλὰ τῷ αἵματι χρηρῆσθαι. μάλιστα μὲν κατὰ φλέβας
τὰς ἐπιφλέσσας, ἢ καταραγείας ἔχουσιν ἢ δὲ μὴ, κατὰ κράν τὰ
εἰδήματα βαθυτέρᾳ, ἢ πυκνότερα. 'Tis to be observed that
Hippocrates is here speaking of such Tumours as have re-
sisted the common Remedies, i. e. of a Tumour of long
standing. De Ulcerib. Lib.

Ἐπὶ ἰνδεδύεν δὲ δεῖ τὰς τομαῖς, ὡς προσωτάτω ταμίῳ
ἀπὸ χωρίων, εἶθ' ἂν αἱ ὠδύναι μεμαθήκασιν γίεθαι, καὶ τὸ αἷμα
ἐκκένεσθαι. Lib. de Ossium Naturâ.

universally and inviolably observ'd in the Profession to this Day. 'Tis to him then, we must chiefly have recourse for the fundamental Notions of, and other Circumstances relating to, this Doctrine, of which the Nature of this Inquiry obliges us to give a cursory Detail. In the first Place, we may observe, that by the Term (s) Ἀντίσπασις, *Revulso*, *Revulsion*, was originally understood, the communicating to a Flow of Humours a Course directly contrary to that which it had before; whether this was drawing it from the anterior Part of the Body, Head, &c. to the Posterior, or *vice versâ*; whether from the Internal Parts, to the External; from the right Side, to the left; from the superior Parts, to the inferior, &c. That on the contrary by (t) Παροχέλευσις, *per canales vicinos derivatio*, *Derivation*, a Term probably borrowed from the Custom of cutting of Drains, Sluices, &c. in order to draw off Collections of Water, prevent Inundations, &c. and from the Similitude which they imagin'd between

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the

(s) In summa, revulsio facienda est, deorsum quidem, ubi succi ad superiora: sursum, ubi ad inferiora vergunt: & ubi introrsum, ad exteriora; ubi extrorsum, ad interiora, &c. Vid. GAL. de Revulsione.

(t) Derivatio ejusdem est generis cum evacuatione facta per particulam, quæ fluxionem suscipit; fit autem per aliquam vicinarum partium, ex. gr. quando per gurgulionem vel palatum fertur fluxio, per nares certe ipsius derivatio congruenter fit, &c. Vid. GAL. de Derivat.

the Effects of these, and those of Openings adjacent to Parts loaded with morbid Humours, adopted into the Profession ; be this as it will, it is certain, by it was meant, either the diverting thro' any adjacent Opening, or the immediately extracting by Incisions, &c. the obstructing, stagnating Humours of tumefied, inflamed, and otherwise disorder'd Parts.

Now the first, who has given us any distinct Account of the Arguments, on which this Doctrine was founded, is the great *Celsus* : “ If
 “ Blood (says this Author) is to be drawn for
 “ the Relief of any one Part in particular, we
 “ ought either to open a Vein of, or at least as
 “ near as possible to, such Part ; nor am (*u*) I
 “ ignorant (adds he) that some are for bleeding
 “ at as great a Distance as possible from the
 “ Part affected, asserting that by this Means the
 “ Flow of Humours is revell'd from, whereas
 “ by

(*u*) Neque ignoro, quosdam dicere, quam longissime sanguinem inde, ubi lædit esse mittendum ; sic enim averti materiæ cursum ; at illo modo, in id ipsum, quod gravatur, evocari, sed id ipsum falsum est. Proximum enim locum primo exhaurit, ex ulterioribus autem ratenus sanguis sequitur, quatenus emittitur : ubi is suppressus est, quia non trahitur, ne venit quidem. The verb *evoco*, literally translated, signifies, to call out, and was frequently applied to the raising Herbs, &c. from the Earth. Hence, we see the propriety of using it, to imply the drawing the Blood from its great receptacles or fountains, the cava, sinus venosus, &c. *Cels. de Med. Lib. II. Cap. x.*

“ by the other it is drawn on, such Part, which
 “ is too much loaded already : but this, (says
 “ he) is wrong, for bleeding first of all exhausts
 “ the Parts, that lie nearest to the Orifice, and
 “ the Blood follows from those at a Distance,
 “ no longer, than while the Patient is bleeding :
 “ when the Orifice is closed, it then follows no
 “ longer, because it is no longer attracted.”

Thus we see, the grand Objection against bleeding near to the Part affected, was a Notion that the Blood is drawn from every Side towards the Orifice, and Parts adjacent, and that, as it should seem by the Arguments above-mention'd, not only during the time of the Patient's bleeding, but for a considerable Time after the Orifice is clos'd ; and it is indeed most probably on this Supposition, that *Hippocrates*, after having ordered Blood to be drawn, as far as possible, from the Part affected, observes, (*w*) that by this Means the Humours will be accustomed to such a Course, or Tendency, as will prevent their Conflux to the Part affected for the future : however this be, that this Notion was a very prevalent one among the Ancients, is beyond Dispute ; though indeed the Time and Occasion of it's Introduction into the Profession are not so certain. That the Ancients had not the least

C 2

Know-

(αυ) ἔτω γὰρ ἀνὴρ ἡκιστα ἥτις μετὰ πολλὴν γένεσιν μεγάλα ἔξαπτες
 ὃ τὸ ἔδος μεταστροφῆς ἀνὴρ ὥστε μὲν ἐς τὸ αὐτὸ χάρις ζυ-
 λᾶσθαι De Offium Natura.

Knowledge, not to say Suspicion, of the Circulation being perform'd in the animal Body, as has been long since demonstrated by the immortal *Harvey*, is now, I think, universally agreed: That the Blood is contain'd in large Quantities in the Veins, and large Reservoirs about the Heart, Lungs, Liver, &c. and that these communicate with one another, they could not be ignorant, though they had no distinct Notions concerning its Inclination, or Tendency, to one Part more than towards another. Now whether or no they may not have taken Occasion, from observing how apt Fluids, contained in Canals, &c. are to (x) continue their Tendency towards any Outlet, as well after, as before it is closed, to imagine the same Circumstance happens with Regard to the Motion of the Blood towards the Orifice in Blood-letting, is to me, I own, Matter of some Suspicion: And, indeed, whether this Notion took its Rise from this Observation, or that of the obvious Effects of Cupping, or of the unlucky Accidents of Inflammation, Tumefaction, &c. that sometimes follow on Blood-letting, when a Tendon happens to be prick'd, or from any other Occasion; it is most probable, that it was not introduc'd into the Profession, until considerable Progress had

(x) Every one must have observ'd this Circumstance in drawing off Liquors of any Kind, from their containing Receptacles.

had been made in anatomical Knowledge, and theoretical Reasoning; as likewise, that it was the chief Motive that induced them to open such Vessels, as they imagin'd were distributed to the Parts affected, as the most likely way to relieve them from too great a Surcharge of Blood, by Means of the attractive Effects of the Orifice, and indeed to the Practice of Bleeding by way of Revulsion in general: Be this as it will, it must be confess'd, that to a Mind free from all Prejudice in Favour of any Hypothesis, nothing can seem so likely to remove the Tumefaction, Pain, &c. attending Inflammations, as the extracting the morbid Humours immediately from such Parts, whose Vessels are thus evidently over-loaded; and indeed it is very probable, that Observations made on the good Effects of spontaneous (z) Hæmorrhages, nay, that the common Sense and Reason of Mankind determined them to some Means of effecting this, either by scarifying, bleeding near to the Part, or the like, long before any theoretical Reasoning was made use of in the Profession: Nor is it at all improbable, that this was the ordinary Way of proceeding in such Cases, 'till the Introduction of the (a) Notions above-

(z) To wit, in Inflammations of the Anus.

(a) *Viz.* That most Disorders are owing to Fluxions; and that the Orifice, in Blood-letting, strongly attracts the Mass of Blood.

above-mentioned, laid it under some Restrictions; for however rational and likely to answer such Practice might seem, no Doubt is to be made, that their Notions, when once they became prevalent, would deter them from putting it in practice, while the Humours were supposed to be in a full Career to the Part affected, *i. e.* in the Beginning of the Inflammation, as well as induce them to bleed at a Distance at this time, as the most likely Means to restrain such impetuous Flow of Humours on that Part; and this indeed was the general Practice: While the Fluxion was supposed to be violent, *i. e.* in the Beginning of an Inflammation, bleeding near the Part affected was look'd on as (*b*) dangerous Practice, and was therefore postpon'd till the (*c*) Decline of the Disorder, when the Fluxion was supposed to be stopp'd; on the contrary, bleeding at a Distance was made use of at any time, during the Continuance of the Fluxion, *i. e.* while the Humours were in full Flow

(*b*) Si vero eas, quæ ex fluxionibus fiunt, inflammationes scarificaveris, magnum afferes malum, ac per initia præsertim. GAL. de Art. Cur. ad Glauc. Lib. II. Cap. ii.

(*c*) Quæcunque ex ipsis longioris temporis existentes, post totius corporis evacuationem, atque aliam opportunam curationem, quasdam durities & nigrities in membris habent derelictas, his sanguinem auferre nihil absurdum est. GAL. in eodem Loco.

(*d*) Flow to the Part affected : In short (*e*) Revulsive Blood-letting took place in the Beginning of Fluxions, and Derivative at their Termination ; and this has been the general Method of Proceeding ever since, with this small Difference, that, whereas the Antients seldom, though indeed sometimes, bled near to the Part affected in the Beginning of Disorders, after having premis'd bleeding at a Distance, the Moderns have in this Respect been somewhat less scrupulous. From what has been said then, I would infer, that there were originally two Opinions, on which the ordinary Practice relating to an Election of Vessels in Blood-letting was founded, and that these were widely, or rather diametrically opposite to each other ; the one being, that bleeding exhausts, the other, that it overloads, the Vessels adjoining to the Orifice ; the one ancient as, perhaps, Medicine itself ; the other, probably, of a much more modern Date ; the one founded solely on Experience,

(*d*) Si etiamnum fluxio valenter irruat, revellere ad contraria studebimus. GAL. Method. Med. Lib. IV.

(*e*) Porro, ut summatim dicam, incipientes Phlegmonas revulsu evacuare oportet ; quæ vero inveteratæ sunt, ex ipsis, si fieri potest, affectis partibus : quod si nequeat, saltem ex vicinis. Etenim in incipientibus avertere quod influit expedit ; in inveteratis autem, ipsum tantum quod affectæ parti infixum est, evacuare. GAL. de Curand. Rat. per sang. Miss. Cap. xix.

ence, the other on theoretical Reasoning, and precarious Hypothesis; the one the Origin of Derivative, the other of Revulsive, Blood-letting; however this be, 'tis the last which has met with by far the most universal Approbation, tho' indeed not so far, as entirely to exclude the former from the Profession: for notwithstanding that the Ancients were pretty well satisfied of the Truth of the last, they had still some Respect for the first; this is, I presume, sufficiently evident from their Practice; for if they had been fully convinc'd of the Truth of the latter, and Falsity of the former, surely they would have regulated their Practice in this Respect solely by the last, and not have admitted of Bleeding near to the Part affected, as we find they did, even in the Decline of the Disorder, when the Fluxion was supposed to be stopped, to wit, for Fear of renewing it; a Circumstance that, according to their Notions, was not, one would think, at all unlikely to happen; and indeed in other Cases, where they suspected (*f*) any particular Parts to be subject to Fluxions, &c. if Blood-letting at any Time became necessary, we see they laid it down as an infallible

(*f*) Quibus autem eximie pars quæpiam, ubi prius evacuati non fuerint, infestetur, haud æque liceat ex quavis parte evacuationem moliri verum sicut in iis, qui pati jam incipiunt. GAL. de Cur. Rat. per S. M. Cap. xix.

infallible Rule, to (g) open a distant Vessel, for fear of inviting the Humours to their usual Route towards the diseased Member, and thereby renewing the Complaint. Thus the grand Occasion of the Restrictions, with regard to the opening this or that Vessel, under which the Use of Blood-letting has been confin'd to the present Day, was a prevailing Notion, that the Orifice attracts the Blood in greater Quantities, &c. on the adjacent Parts, but this in some Measure accompanied with a Suspicion of its contrary Effects. The Ancients were incapable of fully satisfying themselves in this Point, and therefore proceeded with Caution in reducing these opposite Opinions into Practice, and by closely adhering to neither, form'd it partly on the one, and partly on the other: Nor, indeed, need we wonder, that they were at so great a Loss in forming a certain Judgment of a Question, the Determination of which evidently requires an Acquaintance with many Particulars, of which they were totally ignorant: but surely now, that the Knowledge of the Laws of the Circulation, of Anatomy, &c. is arrived at so great Perfection, there is some Room to hope for the clearing up of this Affair, and consequently

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quently

(g) Hæc ratio est, si quidem insigniter infirmam partem aliquam habeant, in quam quæ colligitur plenitudo decumbat, per revulsionem evacuare. GAL. de Cur. Rat. per Sang. Miss. Cap. xix.

quently establishing the Practice, which in this particular Point is evidently and highly irrational and inconsistent, on more steady and uniform Principles. The Question in hand then, and whose Determination, as it is indispensably necessary, so will it immediately tend to the Accomplishment of this desirable Event, is, whether does Blood-letting exhaust, or overload, the Vessels adjacent to the Orifice?

The Method then, which we shall observe in our Endeavour to solve this Point, shall be, *1st*, To examine the two Opinions by the Laws of the Circulation, and consider which of them seems the most agreeable to, and consistent with, those Laws: And *2dly*, To enquire, how far the obvious Effects of spontaneous and artificial Hæmorrhages in the Cure of Diseases, as likewise of the smaller Evacuations, which are evidently greatly analogous to ordinary Blood-letting, concur to the Confirmation of that Opinion, which shall seem most probable from our theoretical, or physiological Arguments.

And *1st*, in order to determine which of the two is most consistent with the Laws of the Circulation, it will be necessary to enquire into the Nature of the many Resistances which are made to the progressive Motion of the Blood, in its Passage through the Blood-Vessels in general. First, then, with regard to the Arteries: And
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here 'tis very obvious, since these Vessels are, even in their Systole, as full of Blood, in Proportion to their now contracted State, as in their Dia stole, the preceeding Column of Blood will make a very considerable Resistance to that which is behind. Another evident Obstacle to its free Transit is the Elasticity of their Coats; which as they contract themselves immediately after each Dia stole, and consequently lessen the Diameters of their respective Vessels, so they must be extended by the Blood impell'd from the Heart, before such Blood can pass through these Arteries. The next I shall take Notice of, is the remarkable Curves, and Angles, which these Vessels make in their Course to the several Parts to which they are distributed, the Effect of which Circumstances in retarding the Blood's Motion is so very self-evident, that I need not insist on it: Another remarkable Impediment to the free Transit of the Blood is their conical Figure: I am very sensible this Circumstance has been the Occasion of some Disputes among the present Physiologists; but, if we consider, that though the conjunct Lumina of all the arterial Ramifications are extremely, I had almost said infinitely, greater than that of the Aorta alone, so that from hence one may be apt to look on this Vessel as a diverging Canal, yet that each individual Artery, trac'd separately from its Origin, is really, strictly speaking, a converging Tube, we shall see no Reason to

doubt but as such it will act on the Blood as it passes through it : To these Particulars I may likewise add another Circumstance, *i. e.* the surrounding Part, whose Effect in impeding the Course of the Blood, will be more or less, as this happens to be Bone, muscular Flesh, or cellular Substance : These then are Circumstances, which make a real Resistance to the Force exerted by the Heart in propelling the Blood through the Arteries, and according as they more or less eminently attend on them, so will this their Effect be proportionally greater or less. The next Consideration that offers itself on this Head is the Manner, in which the progressive Motion of the Blood is continued on through the Veins : This, indeed, is a Point on which the present Physiologists are little agreed : The great Dr. *Whytt* of *Edinburgh*, than whom no Man ever argued more rationally and consistently on medical Topics in general, is of Opinion, that the Force of the Heart reaches no further than the evanescent Arteries :
 “ (b) Beside, says he, the alternate Diastole and
 “ Systole of the larger Arteries, which, in a
 “ great Measure, depend upon the projectile
 “ Force of the Heart, and the Elasticity of
 “ their Coats, there is a vibratory and oscillatory
 “ Motion in the inferior Orders of Vessels, to which the direct Force of the Heart
 “ does

(b) *Whytt* on the Vital and other Involunt. &c. P. 95.

“ does not reach, and where Elasticity is no
 “ way concern’d.” I am sorry that I am oblig’d to dissent from this ingenious Gentleman, to which, indeed, nothing but the most convincing Reasons could have induc’d me; but, not to insist on the noted Observation of Dr. (i) *Hales*, who says, he observ’d “ the Motion
 “ of the Blood in a Frog’s Lungs accelerated
 “ at each Systole of the Heart, not only in the
 “ finest capillary Arteries, but likewise in their
 “ corresponding capillary Veins :” Or of (k) *Walæus*, who was sensible of the same Phænomenon in the Blood’s Flow from the cut Veins of living Animals. I am really at a Loss in accounting, from the Doctor’s Principles, for the following Circumstances that happen in Venesection; if the Force of the Heart is not communicated to the Blood in the Veins, why does it immediately cease to flow from the Orifice, either when the Ligature is made so strait as to intercept its Course through the Artery, or when the Patient faints, and the Heart intermits its Action? And why does it immediately spring afresh, either on loosing the Ligature, or on the Patient’s Recovery from the *animi deliquium*? And, indeed, what is, or whence proceeds, this *animi deliquium* itself? Does it not arise from the Intermission of the Heart’s Pulsation, *ex inopia*

(i) *Hæmastat.* P. 69.

(k) *Epist.* I. P. 781.

opia sanguinis, whereby the Encephalon is robbed of its due Proportion of Blood, or rather the animal Spirits (whether they are (l) reserv'd in Follicles communicating with the nervous Tubes, or are continually (m) secern'd from by the evanescent Arteries, and immediately convey'd into these Canals) depriv'd of that Force, which seems immediately necessary to their Protrusion, and consequently to their Influence on the animal Body? To these Queries I may likewise subjoin from (n) *Haller*, that not only anatomical Injections, but also several morbid Appearances, as Erysipelas, Inflammations of the Tunica Albuginea Oculorum, &c. seem to demonstrate the Force of the Heart, in propelling the Blood, to be much greater, than the Favourers of the above-mention'd Opinion imagine; and that, as from Observations, which have been made on the different Degrees of the Blood's Celerity in the Aorta and Vasa Minima, and Calculations of the Proportion, which the conjunct Areas of the last bear to that of the first alone, it appears that the Blood moves much faster in these, than such vast Disproportion of their Lumina seems to admit of, this its additional Degree of Velocity must be owing to the Force communicated by the Heart.

That

(l) As was the Opinion of *Malpighius*, *Boerhaave*, &c.

(m) As was held by *Ruyfch*.

(n) Vide in *Boerb. Instit. Med.* 215. Not. F.

That the Elasticity of the larger Arteries, and oscillatory Motions of the smaller, both Veins and Arteries, have a considerable Share in propelling the Blood, is very probable, nay is evident, from the noted Phænomenon that occurs in Dissections, to wit, the Collection of almost the whole Mass of Blood in the Cava, and other large Veins; but that these are the sole efficient Cause of the Blood's progressive Motion even in the smallest Orders of Vessels, independently of any Force communicated to it from the Heart, is really extremely improbable; for my Part I am much more inclin'd to attribute it to the Force of the Heart acting in Conjunction with the aforesaid Motions of the Blood-Vessels; for, though it is scarcely credible, that each particular Column of Blood reaches merely by the Impetus it receives at its Ejection from the Heart, to any great Distance from that Viscus, yet it is very easy to conceive how it may, by Means of the intermediate Blood, communicate a Kind of Motion even to that in the Veins, and by that Means gradually, though insensibly, promote its progression through these Vessels: But to come to the Question in Hand.

'Tis very evident that Opening a Vein can affect the Circulation in no other Way, than as it lessens the Quantity of Blood in general, and in some Measure removes the first of the Impediments

ments above-mentioned, to the free Transit of the Blood through its Canals ; of which Circumstances the last chiefly concerns our present Enquiry. 'Tis likewise as conspicuous, that by how much more free a Passage the Blood meets with through the Orifice, than it did through the Vein, before such Opening was made, so much less will be the Resistance to its Transit, not only through the open'd Vein itself, but likewise through its corresponding Artery, with its Branches, and that therefore, by the exact Laws of Hydraulicks, the extraordinary Quantity of Blood injected into such its corresponding Artery, &c. during the Flow of Blood from the Orifice, will bear an exact Proportion to the extraordinary Quantity that now passes through the Vein, or, in other Words, will be greater or less, according as the Patient bleeds more or less freely, and that consequently, as such Vein, with its corresponding Artery, &c. will remain equally distended with Blood as before, no such thing as Derivation, according to the original and strict Sense of this Word, can be affected by Bleeding near to the affected Part; and this indeed, supposing no other Alteration than that above-mention'd to arise from Bleeding, would be the Case : But not only the continually decreasing Quantity of Blood in general, but likewise the Interception of its Flow into the Cava and Sinus venosus dexter, will conduce considerably to diminish the Quantity of

of Blood that will be now thrown into the Vessels communicating with the Orifice: For as a Supply of Blood, equal to that running off, will necessarily be intercepted in its Course to the Cava, &c. the (o) Resistance will be taken off, in some Measure, in every Vessel that empties its Contents, either immediately, or even mediately, into that Reservoir, while the Heart will emit a less Quantity, and even that with less Force than before; and these I apprehend to be the only Circumstances, which prevent these Vessels from receiving an extraordinary Quantity of Blood, equal to that which runs off by the Orifice, or from continuing in the same State of Distention as before. To be more particular, let us suppose (p) 20 lb. of Blood to circulate through the whole vascular System every two Minutes, and the Vena Mediana Brachii to transmit about a sixtieth Part of this Quantity, or 4 oz. in the same Space; and that on opening this Vessel 12 oz. run off within the said Time; 'tis very evident an extraordinary Quantity, equal to 8 oz. must be thrown into the corresponding

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(o) Thus the diminish'd Resistance in the Cava will counteract that in the Vessel in which the Incision is made.

(p) If we suppose the left Ventricle of the Heart to eject 2 oz. of Blood at each Systole, which, perhaps, is pretty nearly the Case, and that the Number of the Heart's Pulsations in a Minute are sixty, the above Calculation will be pretty near the Truth.

ſponding Artery, &c. of this Vein, during the Flow from the Orifice, in order to keep theſe Veſſels equally on the Stretch as before : But this don't appear to be the Caſe, and that not only for the Reaſons above-mention'd, to wit, the Decrease of Reſiſtance in the Cava, of the Heart's Force, and the Maſs of Blood in general, but likewiſe becauſe 'tis hardly credible, ſuch an extraordinary Quantity can paſs into theſe Veſſels, without diſcovering itſelf either by the Strength or Fulneſs of the Pulſation of their correſponding Artery ; now though I have made the Experiment ſeveral times, and that with the utmoſt Care, yet I was never able to diſtinguiſh the leaſt Alteration in either of theſe Circumſtances, during the time of the Blood's Flow, even when the Patient has bled very freely, and that without the Aſſiſtance of a Ligature.

From what has been ſaid, it appears, not only that the univerſally prevailing Dread of inviting the Blood in larger Quantities, and with greater Force, on the Parts contiguous to the Orifice, and of thereby increaſing the Inflammation, Fluxion, &c. on ſuch Parts, is without the leaſt Foundation ; but likewiſe that the extraordinary Quantity emitted from the Heart on this Occaſion, is by no Means (q) equal to
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(q) A grand Miſtake, into which all who have wrote on
this

that which is drawn off, and consequently that the Bleeding really (*r*) exhausts such Vessels, as

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this Subject, since the Discovery of the Circulation, to wit, *Dr. Friend, Butler, &c.* have universally run, is, that they have considered Blood-letting, as taking off the anterior Resistance to the Blood's Motion in, and hereby inviting it in greater Quantities, &c. on, the Vessels corresponding with the Orifice, and that without any Regard to the Quantity extracted from such Vessels: Whereas from the foregoing Calculation, 'tis evident, that, in order to endanger a Rupture of these Canals, by an over-distension of their Sides, the extraordinary Quantity emitted must necessarily not only barely exceed, but that more than triply, the Quantity which pass'd through them, before the Opening was made: Were it possible indeed to take off the Resistance in such Vessels, without diminishing their Contents, such Method would doubtless produce the Consequences which are so much dreaded in Bleeding near to the Part affected; but this is evidently far from being the sole Cause of Blood-letting.

(*r*) Whether or no it be owing to the exhausting Effects of Blood-letting in diminishing the Volume of the Member from which the Discharge is made, that the Ligature generally grows loose after the Patient has been bleeding for some time, I shan't pretend to say: However this be, in order to determine for certain, whether this Operation produces this Effect, I would propose the making the following Experiment. Let an Incision be made in a Vein, for Instance, of the Foot, and when the Blood flows freely, let it be plac'd in a Vessel full of luke-warm Water, to which a small Tube is fitted, for the easier observing the Rising of the Water. Now if it be found that, notwithstanding a copious Discharge of Blood by the Orifice, the

Water

communicate more immediately with the Orifice; nay, it is most probable, that the corresponding Artery, &c. don't receive even so much as they did before the Incision was made; though this, it must be confess'd, is a Point which can't be exactly determin'd: However, if this be the Case, the Depletion which V. S. produces in the Vessels adjacent to the Orifice, must be very extraordinary indeed.

Thus much then with regard to the Effects of Phlebotomy: We shall now, in Consideration of a prevailing Notion, that Arteriotomy is more peculiarly adapted to relieve the Parts adjacent, briefly enquire wherein the Difference between these seems chiefly to consist: The Action of the first then seems to depend on its taking off the anterior Resistance (if I may so say) to the Progression of the Blood, and by this Means enabling the over-distended Vessels
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Water remains nearly in the same State in the Tube, as it was immediately after the Immersion of the Part, we may safely conclude, that Blood-letting really exhausts, as *Celsus* expresses it, *proximum locum*; but if, on the contrary, the Result should be, that it rises to any considerable Height, the Conclusion will not be obvious, since in this Case, in order to form any certain Judgment of its Effects, it will be necessary not only to know the precise Quantity requisite to raise the Water in the Tube to such an Height, but likewise exactly to ascertain the Quantity of Blood emitted by the Orifice, the last of which Circumstances it is impossible to determine.

to propel, or discharge, their Contents, and recover their former State of Elasticity; whereas the last produces the same Effects by taking off the too great Impetus of the Fluids *a tergo*: The only Difference then between the two, supposing equal Quantities of Blood to be emitted by each in equal Times, is, that in case Vessels open'd have an immediate Communication with those which are obstructed, Phlebotomy seems more particularly adapted to discharge such Humours, as have, by their Stagnation, probably, contracted a morbid Quality; and is, on this Account, surely preferable to the other. I cannot conclude this Head without observing, that as the Circulation will immediately, on closing the Orifice, return to its pristine State, or, in other Words, every single Vessel receive its due Quantity of Blood, in proportion to the Resistance it makes to the Force of the Heart, so likewise the Effects of Blood-letting, as relieving this or that Part, will continue no longer, than while the Patient is Bleeding. And hence appears the Absurdity of Bleeding, by Way of Derivation, as it is improperly call'd, in order to break through Obstructions in old Tumours, inveterate Aches, &c.

Thus far then, with respect to the Effects of Bleeding in general, as it appears from considering the Nature of the Circulation: It remains now that we put it to the Test of Experience,

perience, a Circumstance, which when it coincides with our pre-conceiv'd Notions, not only conduces greatly to determine us in our Opinion, but likewise receives no small Degree of Confirmation itself from such Concurrence; since we are hereby fully satisfied of the real Reasons, why particular Methods are peculiarly adapted to the Relief of particular Disorders, when attended with particular Circumstances, and qualified to practice on much surer Foundations, and with greater Satisfaction to ourselves; for if the Practice of Physic is, when at its best, or in its greatest Degree of Perfection, in a great Measure conjectural, it must necessarily be much more so, when it has either reasoning *a priori*, or even Experience, solely for its Basis.

But to proceed to the Point under Consideration: It is an Observation, that can have escap'd no one, who is tolerably well acquainted with Matters of Medicine, that spontaneous Hæmorrhages from the Nose, as they are of Service in many Disorders, so they more especially relieve those of the Head. The Antients were so extremely sensible of the good Effects of these critical Eruptions of Blood from this Part in Fevers in general, but particularly in those attended with a Delirium, and other Symptoms of a disorder'd Brain, that they have been very careful to deliver down to us the many Signs, which, by long Experience, they had observ'd

to forerun such Hæmorrhages, as infallible Rules of prognosticating this salutary Discharge. Thus Heat (*s*) and Tension of the Hypochonders, Pain in the Neck, Weight at the Temples, Mist before the Eyes, Redness of the Face, &c. have been generally observ'd to precede it: And 'tis very remarkable that, as the Delirium, with which these Symptoms are for the most Part conjoin'd, indicates the Vessels of the Encephalon, or the internal Carotids, in some Measure obstructed; so these, in an eminent Manner, demonstrate the Branches of the external ones to be over-loaded with Blood. The all-wise Creator hath, of his wonted Benevolence to Man, made ample Provision against an over-distension, and Rupture, of the Vessels of this tender vital Organ, the Encephalon, by forming the internal Carotids and the Vertebrales extremely crooked, by placing remarkable Valves at their Entrance, and conveying them thro' winding osseous Canals, and by these Means breaking the Impetus of the abundant Blood, with

(*s*) It must be confess'd, that this particular Symptom does not directly indicate an Obstruction of the external Carotids, but yet I am inclin'd to think, notwithstanding a very great Author (*Dr. Swieten*) has accounted for it from a certain Sympathy subsisting between the Nares and Hypochondria, that it is rather owing to the Blood's Regurgitation on, and Accumulation in, the large Vessels adjoining to the Heart, now that its Passage is greatly obstructed through the superior System.

with which there seems to be a Necessity for this Viscus to be continually supplied, before it arrives to it : And indeed, were it not for this admirable Mechanism, it would hardly be possible for this tender pulpy Organ to sustain the Violence of the Circulation in Fevers, without suffering much more than it generally does in this Disorder : Nor is this the only Contrivance Nature has here made use of, in order to preserve this necessary and vital Part ; the Direction of the external Carotids, with respect to the Blood's Course in their common Trunk, is so (*t*) contriv'd, that the extreme Ramifications of these will necessarily be much more expos'd to the Force of the Blood, whenever its Motion becomes more impetuous, than those of the internal ones, and consequently much more liable to be burst ; and hence it is that (*u*) Hæmorrhages from the Nose are so very common in Fevers. Now as these Hæmorrhages are no less remarkable for their good Effects in Disorders of the Head in general, than for the frequency of their occurring, some Authors have

(*t*) *i. e.* They are distributed in a much straiter Line with the common Trunk, than the internal ones.

(*u*) It is very notorious that all the Arteries, which are distributed to the investing Membrane of the Nares, a few small Threads only excepted, which pass through the Foramina of the Os Ethmoides, are deriv'd from the external Carotids,

have from thence taken occasion, not only to open the temporal Artery, jugular Vein, &c. in such Complaints, but likewise from Experience of the good Effect of such Practice, strongly to recommend this Method to others; but by Reason of that above-mention'd universally prevailing Dread of the ill Consequences of Bleeding too near the affected Part, so it has happen'd that this Practice has always been confined in the Hands of a very few, and even these have been too timid and cautious in its Use. The Ancients, who were much more careful in following the Directions of Nature, in the Cure of Diseases, than we are, had, doubtless, some Method of drawing Blood from the Nares themselves in vogue among them, Since (w) *Hippocrates*, (x) *Celsus*, and (y) *Galen*, have all order'd Blood to be drawn *e Nari-bus* in Disorders of the Head; and though they have left us no Directions in what manner to perform this Operation, yet it is hardly credible that they would have recommended its Use, but from long Experience of its good Effects. (z) *Zacutus Lusitanus* tells us, that he

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order'd

(w) Ὅφειλέει δὲ ὃ ἢν αἷμα ἀφαιρέσθαι ἀπο τῶν* μυχίρων, ἢ ἀπο τῆς φλεβὸς ἐν τῷ μετώπῳ. *Περὶ Παιδῶν. Lib. I.*

(x) *De Med. Lib. IV. Cap. ii.*

(y) *Lib. II. de Comp. Medicam. Sec. Loc. Cap. ii.*

(z) *Obs. 12. P. 22.*

order'd an Assistant forcibly to introduce a Quill, whose End was ferrated, into the Nostrils of a phrenetic Person, the Consequence of which was, that a copious Hæmorrhage ensuing he sav'd his Patient: And 'tis very notorious that the (a) *Ægyptians* us'd frequently to open these Vessels in the Disorders of the Brain, Face, and Parts adjacent. It was likewise very customary among these People to open the Arteries of the Integuments of the Head, and that, as (b) *Prosper Alpinus* informs us, with surprizing Success, in the same Complaints. (c) *Riverius* has related several Histories of obstinate and inveterate Head-Achs, which were totally remov'd by this Method. *Hippocrates* has deliver'd down to us two remarkable Instances of the good Effects of spontaneous Hæmorrhages from the Nose in phrenetic Cases: And (d) *Aurelius Severinus* tells us, he cur'd Numbers of phrenetic Patients, by opening the temporal Artery. In short it would be endless almost, and indeed
would

(a) Vide Pr. Alp. de Med. Ægypt. Lib. III. Cap. II.

(b) Multos, qui vel antiquum capitis dolorem pertulerunt, vel oculos longo tempore habuerunt lippientes, per sectam frontis arteriam sanguine evacuato subito quasi præstigio quodam, sanatos fuisse Cayri vidi. Pr. Alp. de Med. Ægypt. Lib. II. Cap. xii.

(c) Cent. ii. Obs. xxi. Cent. ii. Obs. lvi. Cent. ii. Obs. lxxxix. Obs. communic. xiii. and xxxi. & passim.

(d) Vide de Efficac. Med. Cap. de Arteriotome.

would carry me far beyond the Limits I had prescrib'd to this Dissertation, to point out the innumerable Observations that occur in Medical Writers, on the surprizing Relief, which both natural Hæmorrhages from the Nose, and artificial ones from the Jugulars, &c. immediately procure, not only in Inflammations, and other Disorders of the Brain, but likewise of the external Parts of the Head. Circumstances that are so very notorious to all, who have been conversant, in Practice, or among the Writings of Physicians, as to render all farther Quotation on this Head entirely needless. I shall therefore proceed to the Consideration of another Disorder, to wit, the Angina, in which this Method of opening Vessels, adjacent to the Part affected, has ever been recommended as extremely beneficial. It is true, the Generality of Practitioners make it their great Care to open a distant Vessel, by Way of Revulsion, before they will venture to draw Blood from the Ranulæ. (e) “ Since therefore, says the great Dr. “ *Swieten*, in the most dangerous Kinds of “ Anginas the least Increase of the Tumour “ frequently becomes fatal; it is, probably,

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“ for

(e) Cum ergo in periculosis illis Anginis minimum tumoris inflammatorii augmentum sæpe sit lethale: Hinc forte periculum subest, si non prius institutâ largâ venæsectione in locis remotioribus, raninæ venæ statim secantur. Comment. in Boerh. Aph. Vol. II. P. 674.

“ for this Reason, that opening the Ranulæ,
 “ before a large Quantity of Blood be drawn
 “ from the more remote Parts, is attended with
 “ so much Danger.” Now were we to enquire
 their Reason for premising the opening of a dis-
 tant, to that of an adjacent Vessel, they would
 tell us, the first Venesection turns the Course of
 the Blood towards the Extremities, and conse-
 quently directly from the Part, to which it is at
 present præter-naturally inclin’d, and that for
 this Reason opening an adjacent Vessel at this
 time, will not be so apt to draw the Blood too
 impetuously on, and over-load, the already too
 much tumified Part, as if it had been put in
 Practice at first, while the Blood was in full
 Carreer towards such Part ; a Reason, indeed,
 that was excuseable enough in *Galen*, &c. but
 is surely altogether unpardonable in any one,
 who professes to understand the Circulation of
 the Blood ; for, since immediately on closing the
 Orifice, the Circulation will return to its wonted
 Course, opening the Ranulæ will be as likely to
 produce these Consequences at this time, as if
 practised out of hand, provided the Orifice has
 really any such attractive Influence on the Mass
 of Blood, as has been generally ascrib’d to it ;
 but that this is in no wise the Case, is not only
 probable from the preceding Arguments, but
 is extreamly manifest from this single Circum-
 stance, that opening these Vessels in this Dis-
 order

order has been generally look'd on, as the last (f) Resort in Cases of Extremity ; for as the Parts affected, when the Disorder is arriv'd to so great an Height, are so excessively tumified, that there is scarce any Passage left for the Air to enter the Trachea Arteria ; it is very evident, as well that this Method can give Relief in no other Way, than as it exhausts the Vessels of the inflam'd Parts, and consequently diminishes the Tumour, as that, if it has any Influence in attracting the sanguinary Mass, it must, in such Cases, increase the Swelling so far, as *immediately* to suffocate and destroy the Patient ; but if this had been its usual Consequence, surely the Antients would, by no means, have so warmly recommended its Use. The same likewise may be said with respect to the Effects of nasal Hæmorrhages, opening of the Jugulars, &c. in Cases of violent Inflammations of the Brain. Now, as Experience plainly evinces the Efficacy of this Method in desperate Cases, and after all other Means have been tried in vain, there is, I presume, great Reason to imagine it would much more frequently answer, nay, that it would seldom or never fail, if put in Practice in the Beginning of such Disorders.

And,

(f) *Ultimum est, incidere satis altis plagis sub ipsis maxillis supra collum, & in palato circa uvam, vel eas venas, quæ sub linguâ sunt : ut per ea vulnera morbus erumpat : quibus si non fuerit æger adjutus, scire licet à malo victum esse. CELS. de Med. Lib. IV. Cap. iv.*

And, indeed, I have open'd the Ranulæ in Numbers of Patients, labouring under the Angina, and that without premising Bleeding from any other Part, without any manner of ill Consequence; and am intimately acquainted with a Gentleman of very extensive Practice in the Profession, who has pursued this Method for many Years with the greatest Success, having never had the Misfortune to lose a single Patient, among the great Numbers he has had the Care of in this Disorder.

And here, in order farther to demonstrate the good Effects of Derivative Blood-letting, I might have proceeded to collect the concurrent Testimonies of the best, both Ancient and Modern, Writers in Physic, in Favour of this Practice in several other Disorders, as the (g) Apoplexy, Ophthalmia, &c. were it not, that it would have carried me beyond the intended Bounds of this Paper; or rather, that it is, I presume, intirely needless, after having already given such remarkable Instances of its good Effects: And indeed it must be confess'd, if those are not sufficient to convince any unprejudic'd Person, that this Practice is, if not efficacious, at least harmless and innocent; were I, in the same Manner,

(g) Opening the Jugulars, Temporal and Occipital Arteries, Cupping on the Occiput, Nucha, Shoulders, &c. have been universally look'd on as most efficacious in these Disorders, from the earliest Antiquity to the present Time.

Manner, to go through with the whole Catalogue of Ills incident to Mankind, and demonstrate its good Effects in each, it would be to no Purpose ; for surely, if it be possible to determine the good or bad Effects of a Remedy in any one Disorder whatever, it may be done in these above-mentioned, and more especially in their most dangerous Stadia, wherein the least Increase of Tumefaction, in the respective Parts affected, must be fatal. It is, I own, difficult to distinguish between the right and wrong Method of Cure in some Disorders, especially those, whose Nature is remarkably obscure and unintelligible ; some die, and others recover, in the same Diseases, and under the same Regimen : There are many the Doctor can't cure, and many the Nurse cannot kill. The most rational Method, and most approv'd Remedies sometimes fail, while the most preposterous Regimen succeeds : And hence it is, that we are frequently at a Loss in forming a Judgment of the Effects of the Means of Cure, we administer in several Disorders ; but the Nature of the Angina and Phrenitis is so plain and obvious, that we can't so easily be deceiv'd in them : And I will appeal to any Person, but indifferently acquainted with the Nature of Diseases, whether, if Bleeding is really attended with those Consequences, which have been generally attributed to it, opening a Vessel near to the Part affected in either of these Disorders,

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when violent, must not be follow'd, and that immediately, by the (*b*) Death, instead of the Recovery, of the Patient.

And yet how extremely inconsistent with the obvious Consequences of these Evacuations in these Disorders, is the universally espoused Opinion concerning the Effects of Bleeding on the Vessels adjoining to the Orifice? Thus we are told, “ (*i*) It is apparent that the necessary “ Effect of Derivative Bleeding, is, the bringing a greater Quantity of Blood, during the “ Time of the Operation, into that Part where “ the Vein is open'd, than what naturally flowed into it before; the Consequence of which “ will be, that the Capillary Vessels will be distended and over-charged with Blood, from “ whence Obstructions and Inflammations will “ probably arise, or if there happen'd to be “ any before in that Part, they will be increased; but if the Load be so great, that “ the Vessels are unable to bear it, in such “ Case their Coats must give way, and an Extravasation of Blood ensue.” Hence we see the

(*b*) And this surely is an Event, which we may with so much the greater Assurance of Certainty foretel would be the Consequence, as in the worst Stadia of both these Disorders the Parts affected are so extremely tumefied, that the least Addition to their swelling must inevitably destroy such Patients.

(*i*) *Butler* on Blood-letting, P. 57.

the dreadful Apprehensions, that have constantly deterred Practitioners from bleeding near to the Part affected, and I am well satisfied, this single Circumstance of the Medical World's being so firmly perswaded, that the above-mention'd Effects on the Vessels closely communicating with the Orifice, are the necessary and unavoidable Consequences of taking off the Resistance of the preceding Blood in them, as happens in Bleeding, has been the grand, if not the sole, Occasion, why the many Phænomena, that occur in the spontaneous, and artificial, Cures of several Disorders, and which evidently make against this universal Opinion, have been hitherto overlook'd. For my Part, on reflecting on several, both artificial and natural Evacu-
 ations, which are known to be of singular Benefit in particular Disorders, I can't forbear attributing these their remarkably salutary Effects to this, that as they are made from such Vessels as have a close Connection with those of the Parts affected, they relieve these of any præternatural Load, with which they happen to be over-charged. It is, I presume, for this Reason, that the Hæmorrhoidal Flux is so remarkably beneficial in Obstructions of the Viscera of the lower Belly: For this, that copious Discharges from the (i) Uterus in *Puerperis* carry off Ob-
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(i) The remarkable Consent subsisting between the Breasts and Uterus has been Matter of much Speculation

structions of the Vessels in the Breasts, & *vice versa* : That a Flow of Blood from the Hæmorrhoidal Vessels in the Piles, and a copious Discharge

among Physiologists. Some have attributed it to the Inosculations of the Mammary and Epigastrick Arteries, and others to a Similarity in the Texture of both, as being Glandular Substances : But surely, even granting such a Similitude between them in this Respect, it by no Means necessarily follows, that this Circumstance is sufficient to constitute this so notable a Consent between them ; unless we can likewise demonstrate the same between all other Parts, that agree in this same Respect of a similar Texture. We see the Breasts and Uterus, that were to be thus subservient to each other, are plac'd at a great Distance, and we know of no other Circumstances peculiarly attending them, in respect of many other Parts situate at the like Distance from one another, to which we can attribute this Sympathy, than that of the remarkable Inosculations of their Vessels : This then seems to be the Means the all-wise Creator has made use of, to establish this, on many Accounts, so necessary a Consent between them : Hence it is that Cupping on the Breasts takes off the over-Distension of the Uterine Vessels in Floodings, that a copious Flux of the Lochia so remarkably lessens the Flow of Milk from the Breasts, & *vice versa*. We have here then an evident Demonstration, how very apt Discharges of Humours are to exhaust those Vessels in particular, that have a close Connection with the Parts from whence such Discharges are made ; and that more especially in this Case, where we observe they communicate this Influence at so great a Distance : And indeed those critical Metastases of Humours from one Part to another, which sometimes occur in Practice, may, so far as we can tell to the contrary,

Discharge of Mucus from the Nares in a Pain of the Head, are so eminently serviceable in these Complaints: For this, the (k) Drains by Ustion, &c. (as was practised by the Ancients in general, but more especially by the (l) *Ægyptians*) in all internal Suppurations, made as near as possible to the Place where such Collections of Matter are lodg'd, are so beneficial; for this, that those on the Head and Neck re-

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trary, depend on the same Kind of Disposition of their respective Vessels. It is very remarkable, that *Galen*, speaking of Cupping in Floodings, says, “ Sic ad mammillas cucurbitam imponimus, cum sanguis ex utero profluit, defixo maxime in ipsis *communibus* pectoris & uteri vasis, ejus ore. Method. Med. Lib. XIII.

(k) Mr. *Monro* used to give a remarkable Instance of the good Effects of these in internal Suppurations in his Prælections, viz. A Lady, who had accidentally received Hurt, by a Fall on her Side, and had neglected all medicinal Applications, began, in about three Months after she had met with the Accident, to expectorate, and discharge by Stool, a good deal of purulent Matter; as she was likewise Hætic, it was imagin'd that the Lungs adher'd to the Diaphragm, and that an Abscess was form'd on this Part; however, on procuring a plentiful Discharge from her Side by a Seton, the Hætic and other Symptoms soon left her for some Months; when imagining herself in no Danger of a Relapse, she dried it up: On this the Symptoms soon recurred as at first, the Seton was now renew'd, and continu'd for two Years, the Consequence of which was, that she was cur'd, and remain'd well for many Years.

(l) Vide Prosper. Alpin. de Med. *Ægypt*.

lieve the Epileptick, on the Mammary and (*m*) Scapular Regions the Consumptive, and on the Parts behind the Ears the Convulsive, and other Disorders of Infants ; that Scarifications on the affected Side in the Pleuresy, on the Breast in the (*n*) Peripneumony, on the Right Side in Inflammations of the Liver, and on the Left in those of the Spleen, are so peculiarly of Service in these respective Disorders : In fine, to this it is owing that scarifying on the affected Part in the Erysipelas, Gout, Rheumatism, Tooth-Ach, habitual Redness of the Face, &c. gives so much Relief in these Complaints. I should now proceed to take Notice of the several Evacuations that are, in some Measure, analogous to ordinary Blood-letting, and consider how far their most obvious Effects tend to confirm
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(*m*) Thus I have more than once known a perpetual Blister between the Shoulders remove a violent Cough, when attended with Hætick and other Symptoms of a Beginning Consumption, even after the common Remedies, *viz.* Bleeding, Purging, Anodynes, Balsamicks, &c. have been tried in vain : Whether these good Effects, in such Cases, be not owing to the Circumstance of its immediately exhausting the Vessels that have a close Connection with the Bronchial Arteries, I own, is to me Matter of much Suspicion.

(*n*) With respect to Inflammations of the Lungs, it is very notorious, that no Evacuation is so peculiarly beneficial in any Disorder, as a plentiful Discharge of Matter from their Vessels themselves, by Expectoration, is in this,

our Opinion concerning those of that Operation.

But before I enter on this Enquiry, I must beg Leave to anticipate an Objection, which I am very sensible will be made against the Doctrine above advanced; and that is, the immediate Effect, which Bleeding at a Distance is generally observed to be attended with in restraining spontaneous Hæmorrhages, it will be said, should seem to depend on its turning the Flow of the whole Mass of Blood to the Orifice, and, consequently, from the Part affected: Now, though this be the general Way of accounting for the speedy Effects of this Practice, yet I am inclined to think, and that not only for the Reasons above assigned, but likewise for the following Considerations, that these are entirely and solely owing to it, as it takes off the Plenitude of the Vessels in general, and, consequently, weakens the distending, or that, Power, by which the contained Fluids push *qua data porta*, or at the Orifice of the bleeding Vessel.

In the first Place we may observe, that in many Hæmorrhages, the Loss of Blood is really, strictly speaking, their sole Cure, as is evidently the Case in those that are stopped without the Assistance of either revulsive Bleeding, or other medicinal Application, and recur either

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on any extraordinary Heat, or Agitation excited in the Blood, or at such Intervals, as are sufficient for a Regeneration of the Plethora; as we know happens in many Cases of Hæmorrhages, but particularly in those of the Nose in young and plethoric Subjects. Secondly, If we allow the commonly supposed Effects of Blood-letting, in strongly attracting the Mass of Blood, to be true, we must necessarily likewise allow the same Effects to be produced by the Orifices of the bleeding Vessels in spontaneous Hæmorrhages, but, at this rate, no considerable Hæmorrhage would stop *suâ sponte*, till either the Patient were dead, or the Body nearly exhausted of its Blood; whereas we see they frequently do, without any medical Assistance whatever; and with regard to that of revulsive Bleeding, I will be bold to say, it never can save the Life of any Patient in such Cases; and, indeed, I can't forbear thinking, there is just as much Room to expect salutary Effects from this Practice in accidental, as in spontaneous Hæmorrhages; and yet it is not only strongly recommended by the best Authors in the first Age, and universally made use of by the ablest Practitioners in the last, when, at the same Time, the whole medical World would look on him as a downright Madman, who dared even to propose it in the first; and that, though it must be confessed, he would have every whit as much to offer in Vindication of such Practice of his, as they

they could produce in Support of theirs. But to return.

The first Evacuation, whose Nature and Effects I shall consider, is that made by Suppuration, or rather by the Discharge of Pus. The *Boerhaavian*, and generally received Hypothesis concerning this Process, the Formation of Matter in Abscesses, is, that the Tunics of the obstructed Vessels, being melted down together with their stagnant morbid Contents, constitute that uniform white Liquor which is termed Pus: Whether or no this be really formed by such a Solution, or is not rather compos'd solely by the obstructing Humours extravasated, and by some kind of intestine Fermentation, excited by the Warmth of the Place in which they are deposited, thus chang'd in their sensible Qualities, I shall not pretend to determine: It is sufficient for my Purpose to observe, that the Tension, Tumefaction, Redness, Pain, &c. so remarkable in the Increase of Inflammations, immediately abate on the Formation of Pus, and on its subsequent Discharge soon totally disappear. A notable Instance surely of how great Consequence a Discharge of Fluids from, or nearly from, the obstructed, over-distended Vessels themselves is to their Depletion; and which Nature herself points out in this salutary Discharge, that we may never want an authentick and warrantable Precedent, for making Evacua-
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tions from the particular Parts that happen to be affected. But here it will be objected, that the above-mention'd Effect of Suppuration, in exhausting the circum-ambient Vessels, &c. by no means proves that Blood-letting has the same Effects on those near the Orifice; that Pus is a Liquor very different from Blood; and that therefore these salutary Consequences of its Discharge may depend, so far as we can tell to the contrary, on its being the morbid offending Matter, or on some other Circumstance attending the Process of Suppuration, into which we can by no Means penetrate: To this I answer, that at present I am arguing only that this Discharge of Pus exhausts, rather than invites more Liquors into the adjacent Vessels, merely as they are adjacent; and this is manifest, not only from its above-mention'd Effects, but likewise from its exerting the same Influence on any Tumour, &c. that happens to be situate in its Neighbourhood; nay, so great is this its exhausting Power, that, if long continu'd from any Part, it seldom fails to render such Part, however plump and fleshy before, thin and emaciated, and this while the other more remote ones continue in their natural State. As to the Conclusion I would draw from these Effects of purulent Discharges, of that hereafter: And this leads me to the Consideration of another Evacuation, whose Introduction into Practice, doubtless, took its Rise from the Observation

servation that was made on the good Effects of the spontaneous one, I have been now speaking of, I mean that made by Issues, Setons, &c.

And here it will, I presume, be to no Purpose to insist on the great Advantage of making these Drains as near as possible to the Part design'd to be reliev'd; not but that they frequently take Effect, even when they are applied at a great Distance from such Part: But, notwithstanding this, the whole Medical World will, I imagine, concur with me in asserting, that the (o) nearer they are made to such Part,

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(o) *Hippocrates* in an Apoplexy gives the following Advice, Καῦσον τὴν κεφαλὴν, ἐσχάρας ὀκτώ, &c. and adds, ταῦτα ποιήσαντι ὑγιὲν ἐξίτελει, which evidently shews, how great Stress he laid on this Remedy. De Morbis Lib. ii.

In Tumefactions of the Liver and Spleen he orders the respective Regions of these Viscera to be cauteriz'd. Lib. de intern. Affection.

Celsus, speaking of the Sciatica, tells us, the most effectual Remedy is, Tribus aut quatuor locis super coxam cutem candentibus ferris exulcerare; and adds below, that whenever we apply this Remedy, we should always keep the Ulcer open, till the Disorder is remov'd. De Medicina Lib. IV. Cap. xxiii. The same Author likewise tells us, that few of these fixed Pains, Ubi inveteraverunt, citra unctionem finiuntur. In a Phthisis Pulmonalis, says this Author, Exulcerandus est (Sc. Æger) ferro candenti, uno loco sub mento, altero in gutture, duobus ad mammam utramque: Item sub imis ossibus, quas ὀμοπλάτας Græci vocant, sic, ne sanescere finas ulcera, nisi tussis finita fuerit.

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the greater Probability there is of their Success : And this, indeed, is a Circumstance, of which even the most barbarous and unciviliz'd Nations are sufficiently appriz'd, as is manifest from their almost constantly applying them near to the Part indispos'd. A Practice, which as it can have taken its Rise among them from no specious Hypothesis, or Reasoning *a priori*, so doubtless it owes its Origin solely to their Experience of its good Effects. Taking this Circumstance then, with Regard to the Situation of these artificial Outlets, for granted, the next I shall take Notice of, is the Quantity of Humours which they generally discharge ; and this, indeed, is so extremely small in Comparison of the whole Mass of Fluids in the Body, that there is not the least Room to suspect their Action any way to consist in exhausting the whole vascular System :

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In fine, it would be endless to point out the innumerable Instances of the above-mentioned Method of applying this Remedy, that occur in the Writings of the Antients. Nay we are told, the *Arabians, Chinese, Japanese, Tonquinese, Persians*, and many other Nations, apply this universal Remedy in the same Way, and lay great Stress upon it, in the Cure of many different Disorders. Dr. *Willis* tells us, he sav'd several Children by applying Leeches to the Jugulars, and cutting an Issue in Nuchâ, soon after Birth ; whereas two or three, belonging to the same Parents, had died convuls'd for want of this Remedy. De Morb. Convuls. Cap. iv. He has also given us a most extraordinary Instance of the good Effect of an accidental Exulceration of the Face, &c. in curing an Epilepsy. De Morb. Convuls. Cap. iii.

On the contrary, in Consideration of these two Circumstances attending them, I think it is very manifest, that it depends on their immediately affecting the adjacent Vessels; and this I take to be effected in the following Manner: 'Tis, I think, generally agreed, that these Disorders in particular, in which Drains thus applied are more especially beneficial, viz. fix'd Rheumatic and Ischiadic Pains, scrophulous Tumors, &c. proceed from an Obstruction, and over-distension of the Vessels of the Part affected with (morbid) Humours: Now if we suppose the Vessels, whose Orifices open into these artificial Emunctories, to be contiguous with those obstructed, by Means of those frequent arterial Inosculations, which are so remarkable in every Part of the Body; or indeed to be barely contiguous to, and arise from the same capillary Trunks with, such obstructed Vessels, their Effects are equally easy to be accounted for: If the first Supposition be true, it is obvious to conceive, how the stagnant morbid Saburra, now that the Resistance to its progressive Motion is in a great Measure taken off, may by means of the Force communicated to it by the Heart be propell'd, and gradually discharged thro' those minute Ramifications that open into these Drains, and the affected Vessels themselves, which must necessarily, from the long continu'd State of Distension, in which they have remain'd, have lost a good deal of their natural Elasticity, re-

cover their former Tone, and thereby a fresh Collection be prevented; or, in other Words, the Disorder in a while totally cur'd; if the last take place, 'tis as easy to imagine the Fluids, which are moving towards the obstructed Vessels, now that they meet with an easier Passage than before, through the lateral Branches opening into these Outlets, will make but little Push at the Mouths of the first, and therefore they will be able, by their own vibratory Motions, to expel their Contents; and, indeed, these are so much the more likely to be the Consequences, as in all Probability the excretory Canals will, in Process of Time, by Means of the constant Flow of Liquors thro' them, be (*p*) enlarg'd, much in the same Manner as has been observ'd of the lateral Vessels, after the Operation for the Aneurysm, and consequently the Nisus of the Fluids on the affected Vessels still farther diminish'd; which ever, I say, of these Suppositions,

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(*p*) I question but this same Kind of Dilation of the excretory Vessels of old Ulcers, particularly of the Legs, is frequently the chief, if not the sole Cause of that Difficulty we meet with in cicatrizing them; and yet we see that Issues, properly applied, frequently make a firm and lasting Cure of these Cases, even when all other Means have been tried in vain; an Effect, which, in all Probability, they produce, not by draining away acrid morbid Matter, but entirely by intercepting and diverting the Flow of Liquors from the relax'd Vessels, and thereby enabling them to recover their pristine Tone.

and one must be true, the salutary (*q*) Effects of these Means of Cure, doubtless, depend on their emptying (*r*) the adjacent Vessels; a Circumstance,

(*q*) Some have attributed the good Effects of Issues to a certain Disposition in their Vessels to secern the *Materia Morbida* of Diseases from the Blood; but from what Causes such an Alteration in their several Circumstances, as is requisite, in order to enable them to transmit only the morbid Humours, and that too of many different Disorders, and in which the constituent Parts of these Humours are as widely different as the Disorders themselves, can be produc'd, is to me extremely unaccountable. Their Effects, indeed, have been generally consider'd in the same Light with those of ordinary Blood-letting, to wit, as either universally Evacuative, Revulsive, or Derivative; but surely the extremely small Quantity of Humours, which these Out-lets discharge, entirely prevents them from answering either of the two first of these Indications of Cure.

(*r*) The Great Professor *Monro* used to relate a Circumstance of the good Effects of Issues, which so remarkably makes for my present Purpose, that I must beg Leave to transcribe it. A Child that was subject to Inflammations in its Eyes, and scrophulous Tumours in its Neck, had a Drain made in the Nape of the Neck, the Effect of which was, that the Tumours, &c. soon disappear'd: But on its being dried up, they return'd again; however the Drain was again renew'd, and the Disorder soon remov'd; and it was thus alternately dried up, and made afresh for several Turns, and always with the same Consequence. A remarkable Example surely, that Drains exhaust the neighbouring Vessels; and yet there are not wanting some Practitioners, who seem almost as much to dread an Attrahent Quality in these, as in the Orifice in Blood-letting; nay this

cumstance, which I remember to have seen demonstrated, beyond all Possibility of Contradiction, in a Woman, who had a cancerous Tumour taken from her Arm, which, though it immediately began to repullulate on the Cicatrization of the Wound, yet on making a large Issue close by it, soon totally disappeared.

Before I quit this Head, I must beg Leave, in Consideration of these obvious Effects of Drains on the neighbouring Vessels, to propose the Use of these Remedies in two remarkably fatal Disorders, in which they are seldom or never applied ; the first of these is the Bronchocele, a Disease that is pretty common, especially among the Female Sex, and which seldom fails, notwithstanding the Assistance of the ordinary Means of Cure, to prove fatal in the End : Now, as it evidently arises from such a præter-natural Tumefaction of the Parts surrounding the Fauces, and particularly of the Glandula Thyroidea, (which I had lately an Opportunity of observing in a Woman who died of the Disorder) as gradually straitens, and at last totally obstructs the Œsophagus ; whether or no would not the timely opening a large Drain on the anterior Part of the

this Notion has some Way been communicated to the Vulgar, for I remember that, when I was proposing to make an Issue in the Neck of a young Woman, who was disorder'd in her Head, it was objected, that it would draw the Humours too much upwards.

the Neck be the most likely Means of preventing the Increase of such Tumour, and consequently the happy Termination of the Disorder? The next is no other, than---the Hydrophobia; a Disease which, however constantly mortal, seems to proceed altogether from a kind of Inflammation on, and Irritability of, the investing Membrane of the Epiglottis, Rima Glottidis, &c. and the convulsive Spasms and Suffocation that follow immediately on any Attempt to drink, and, when the Disease arrives at its worst State, even on the Sight, or bare mention of Liquids; but as I have offer'd several Arguments in Support of this Opinion in (s) another Place, I must humbly intreat the candid Reader to excuse my repeating them here, and defer passing Sentence of Condemnation upon me, however wild and chimerical this Hypothesis may seem to him, untill he has had an Opportunity of perusing the Arguments therein advanc'd: It may suffice at present to take Notice, that it was this Opinion that induc'd me to propose making a large Drain on the fore Part of the Neck, as soon

(s) *Thesis Inauguralis de Epilepsiâ* Edit. Ludg Batav. Ann. 1753. In this Dissertation it is render'd extremely probable, that the universal Convulsions, which generally carry off Hydrophobick Patients, and likewise those of Epilepticks, Hystericks, &c. proceed from one and the same Cause, to wit, such spasmodical Contractions of the Rima Glottidis, or the expiratory Muscles, as for a while intercept the Respiration of, and suffocate these Patients.

soon as possible after the Hydrophobick Virus is infus'd, in order to divert, derive those Humours which are, in Process of Time, apt to be, as it were critically, deposited on the Parts adjacent to the Rima Glottidis, and thereby occasion that dreadful and ever fatal Symptom, the Hydrophobia, to the external Parts; and sure I am, that as there is some Probability of its succeeding, and as the ordinary Means, alas! too frequently fail, it might be worth while to try it. But to return from this tedious, and, as I fear it will be termed, impertinent Digression.

The noted Method of curing Disorders by Inuision, and keeping the Ulcers open by way of Drains, was ever look'd on as most efficacious in many obstinate and inveterate Complaints; and we find, that it has always been customary in making these Outlets to fix on the nearest Part, that could most conveniently, to that affected: Now the Use of these may, in a great Measure, be compar'd to that of the natural Emunctories of the Body; and Nature, we see, has taken particular Care to place these near to the Parts, whose Recrements they were design'd to carry off, or which they were intended otherwise to relieve; and that in order the better to establish an intimate Communication between the Vessels of both, as being a Circumstance necessary to their producing the design'd Effects:

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The soft pulpy Texture of the Glandular Parts renders them very apt to swell, whenever the Blood is determin'd with greater Impetus than usual, on their numerous tender Vessels: Thus in Inflammations of the Arms, the Axillary; of the Genitals, the Inguinal; of the Head, the Parotid Glands frequently swell, and sometimes suppurate, by which Circumstances the obstructed Vessels of their respective Neighbours are greatly reliev'd.

Another Evacuation, which is wont to be made from the Parts affected, and that with great Relief to the Patient, is that by Scarification, &c. The Antients used to scarify the Parts affected in many Disorders, as the Erysipelas, fix'd Pains, &c. especially when such Complaints remain'd obstinate, notwithstanding the Application of other Remedies. The Great Dr. (t) *Friend* tells us, that “ In inflammatory Cases, and in the Erysipelas particularly, it is often seen by Experience, that scarifying upon the Part, when the Membranes are loaded and thicken'd, will remove the Inflammation in a very sudden and surprizing Manner.” And I was myself a while ago Eye-witness to a most successful Application of Leeches to a violent Erysipelatose Tumor, that had spread itself over the Scalp of an Infant, and had already

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(t) Hist. of Phys. Vol. I. P. 76.

ready so far affected the Brain, as to render it Comatose and strongly convuls'd by Intervals, so that its Life was despair'd of, and which, together with the other Symptoms, soon abated after the Use of this Remedy; and it is now become a pretty common Practice to scarify, and that with Relief to the Patient, in Inflammations of the Eye-lids, Tonfils, Uvula, &c. The *Ægyptians* scarcely ever omitted this Remedy in any Disorder, in which they could conveniently make use of it; and though both these, as well as the Ancients, generally, if not always, premis'd some other Evacuation, yet as this was owing to the unreasonable Dread, above-mentioned, of increasing the Fluxion, unless some Evacuation was first made from a distant Part, this Circumstance will not, I presume, after what has been said, be any Objection to the Conclusion I would draw from the Success of this particular Evacuation in Favour of the Practice I would recommend.

And here, perhaps, it will be ask'd, what has all this to do with the Effects of drawing Blood in large Quantities, as in ordinary Blood-letting, on the Vessels adjacent to the Orifice? To this I answer, that in the animal Body, a Machine, in which every thing is adjusted *numero, pondere, & mensura*; a System of Vessels, whose Fluids circulate by the most exact Laws of Hydrostaticks and Hydraulicks, the consequent

quent Effects of the larger and smaller Evacu-
 ations of these Fluids, with respect to increasing,
 or diminishing, their Force, or Impetus, on the
 several Ramifications of its Vessels, as adjacent
 to, or remote from, the Parts from whence
 such Discharges are made, will differ only *quoad*
plus & minus, or in exact Proportion to the
 Quantities that happen to be emitted; in every
 other Respect they will necessarily be the same,
 whether you draw off a Pint or a Drop, a Pound
 or a single Grain: If therefore Phlebotomy
 really invites the Blood in larger Quantities,
 &c. into the Vessels adjacent to the Orifice,
 there is no Doubt to be made, that the smaller
 Discharges of every Kind, by taking off the
 Resistance to the Fluids *a tergo* in the Vessels
 communicating with their respective Orifices,
 produce the same Effect; but it is manifest from
 the Consequences, that follow all these Evacua-
 tions, that they have no such Effect; nay
 that, on the contrary, they never fail to relieve
 such adjacent Vessels of any præter-natural Sur-
 charge, under which they happen to labour;
 and from hence, I hope, I may safely conclude,
 that in order to render Phlebotomy, and other
 Evacuations, as beneficial as possible to our Pa-
 tients, we should make them from Parts adja-
 cent to those, which are designed to be re-
 liev'd.

And here I must beg Leave to observe, that the Terms Revulsion and Derivation are not only frequently confounded together, but likewise greatly wrested, and more especially this last, from their original Significations. Thus many Authors, when they advise Blood-letting at a Distance from the Part affected, tell us, it is done by way of deriving the Impetus of the Blood from such Part : Whereas this is, according to the strict and original Sense of the Word, revelling; and this is an Error, into which even the great Dr. *Boerhaave* has run, and that in the (u) Work, in composing which he has had so great Recourse to the Writings of the Ancients : The same Mistake is likewise frequently committed in the Use of the Term Revulsion, when it is applied, as is frequently the Case, to imply the *modus operandi* of Bleeding near to the affected Part. But there is one (w) Error, with Regard to the Application of the Term Derivation, which is of so gross a Nature, and withal so extreamly common, that I cannot forbear mentioning it ; and this is the using it to imply the Determination of the Blood with

(u) Aph. Pr. §. 1024. Pressio in vasa cerebri minuitur i^{ma} Derivatione in alia & opposita loca.

(w) Ut copiâ majore in partes affectas veniat sanguis, facit Derivatio, ut minore, Revulsio. Friend de Feb. Comm. ii.

with greater Force, &c. on the Parts adjacent to the Orifice, in order to break through any Obstructions form'd in their Vessels ; for surely this was far from being the Intention the Ancients had in View, in the Administration of this Species of Evacuation. And this, I presume, owes its Rise to a prevailing, but mistaken Notion, that the Effects of both kinds of Evacuations are to be (x) ascrib'd to one and the same Cause, to wit, the attractive Influence of the Orifice on the Mass of Blood, and consequently that the Ancients deferr'd Bleeding near to the Part affected, untill the Humours were firmly impacted in it, or the Tumour had acquir'd, as *Galen* calls it, a scirrhus Quality, with a View of (y) inviting the Blood with greater Force on, and

(x) “ From hence, therefore, I think it appears plainly, “ that in every Blood-letting, or as often as a Vein is “ open'd in any Part of the Body, there always is both a “ Derivation and Revulsion with Respect to different Parts “ of it; the latter being a necessary Consequence of the “ former.” *Butler* on Blood-letting, P. 55.

(y) This is, in a great Measure, making the Ancients guilty of the most gross Inconsistency in their Practice imaginable, first to bleed, in order to draw the Humours from, and the next Moment to invite them back on the Part affected : No, they were far from being so stupid.— The Case was, they bled near to the Part affected with a View to deplete its over-distended Vessels, but were fearful of putting it in Practice, while the Humours were in full Flow towards such Part, and this was the Motive that induc'd

and therefore of breaking through the Obstructions in, such Part : But, not to insist on what is above advanc'd relating to the fundamental Principles, on which these two Intentions were founded, the Unreasonableness of this Notion is apparent from Multitudes of Passages that occur in the Ancients : Thus *Galen* tells us, (z) “ the
 “ Indication in every Inflammation is one and
 “ the same, to wit, the exhausting the in-
 “ flam'd Part of its too abundant Blood :”
 And again, (a) “ In Disorders of the Extremi-
 “ ties, make your Evacuations from their
 “ respective Fellows, and this, whether you in-
 “ tend to revell or derive.” Nay, even their
 opening the Saphæna in menstrual Obstructions
 seems to have been practis'd with a Design of
 emptying the uterine Vessels of any præter-natu-
 ral Collection of Humours, or, if we consider
 that in these Cases there is, for the most Part,
 either a Vomiting of Blood, or Pain in the
 Head, Stomach, &c. of inviting the Blood from
 its unnatural Route to such Parts towards the
 Orifice,

induc'd them to defer it, 'till Blood had been drawn from
 a distant Part, or 'till the Disorder was on the Decline.

(z) Quo fit, ut indicatio omnibus sit communis, nempe
 vacuatio redundantis, in particulâ phlegmonè obsessâ, san-
 guinis. Meth. Med. Lib. XIII. Cap. II.

(a) Patientibus vero extremis Membris, a conjugibus
 evacuatio faciendâ est, siye retrahere velis siye derivare.
 De Art. Cur. ad Gl. Lib. II. Cap. ii.

Orifice, and consequently into its wonted Channel, or, in other Words, by way of Revulsion, rather than of drawing it with greater Force, &c. on the Uterine Vessels, in order to break through their Obstructions.

From what has been said, in order to fix more determinate Significations on, and such as are more agreeable to what was originally implied by, the Terms Revulsion and Derivation, (were it not that it may be deem'd arrogant in me to attempt such Reformation) I would apply the first to denote the Operation of those medical Means, which, by stimulating the Parts to which they are applied, invite the Blood in larger Quantities, &c. on such Parts, and this when applied at a Distance, with an Intent to avert the Force of the Circulation from the affected Part : Whereas, by the last I would understand that of such as divert, derive the obstructing Humours of the Part affected through an adjacent Outlet; thus Catharticks, Vesicatories, Sinapisms, &c. seem best calculated to answer the Indication of Revulsion ; and Bleeding, Issues, Setons, &c. that of Derivation. The Derivative Effects of ordinary Blood-letting are quick and transitory; those of Issues, &c. slow and lasting : And hence it is, that the first is more peculiarly adapted to the Cure of acute, the last to that of chronick Disorders. Among the Revulsive Means of Cure, there is is not
one,

one, that is in so eminent a Degree Revulsive as Catharticks; and that because, while they irritate, stimulate, and consequently determine the Blood in greater quantities, &c. on the mesenterick Vessels, they likewise discharge a large Quantity of Humours out of the Circulation. Now if to these Circumstances we likewise add the following, that their Operation continues for a considerable Time, and that the Humours they discharge, to wit, the bilious, serous, &c. are, of all others in the Body, by far the most apt to acquire a morbid Taint, we need no way admire their extensive Use, and surprizing Efficacy, in the Cure of almost every, as well acute, as chronick, Disorder. The obvious Effects of Vesicatories are to determine the Blood in greater Quantity, and with greater Impetus on the Parts to which they are applied, and that by Reason of the (b) Pain they excite; but as the Quantity of Liquors they discharge is but small, and especially as they are apt to encrease the Impetus of the Fluids in general, their Revulsive Effects are by no Means equal to those of Catharticks; they have however this Advantage over the others in this Respect, that they can be applied at what Distance the Practitioner pleases from the affected Part: And here I can't forbear observing, that considering

(b) *Dolor sanguinem ad se trahit*, is an Observation as antient as *Galen*. De Cur. Rat. per Sang. M. Cap. viii.

Considering the suspicious Nature of the ordinary
 vesicatory Applications, 'tis great Pity, that
 others are not in general substituted in their
 stead, especially as the *Materia Medica* supplies
 us with such Numbers of Simples, whose vesi-
 catory Qualities are as remarkable, and which
 are in every Respect harmless and innocent.

We may observe the Antients, in the Distinc-
 tions they made between Revulsive and Deri-
 vative Evacuations, had as much Respect to
 the opposite, as to the remote Situation of the
 Part affected, with Regard to the Place from
 whence they were made; and from hence it is,
 that they sometimes advise Cupping, for In-
 stance, in the Nape of the Neck, in beginning
 Pains of the Sinciput, and that under a Notion
 of revelling; whereas it is pretty evident, as
 well from the literal Signification of the Term
Ἀποχέλιον, as from the Definition they have left
 us of this Species of Evacuation, that, had they
 been acquainted with the true Distribution of the
 Blood-Vessels, together with the Course of the
 Blood through them, they would have term'd
 the Evacuation in the present Case Derivative.
 The same likewise may be said of bleeding in
 the frontal Vein in beginning Pains of the Oc-
 ciput, of opening the temporal Artery in vio-
 lent Ophthalmias, and in short of all other Eva-
 cuations made from Vessels adjacent to the Parts
 affected, at whatever Time of the Disorder, or

with whatever Intention they are instituted; for surely it is the Vicinity of the open'd Vessels to such Parts, not the previous Indication the Operator has in his Eye, that renders them thus beneficial in these Cases; and therefore their good Effects greatly confirm our preceding Arguments in favour of Bleeding near to the affected Parts, by way of Derivation.

CONCLUSION.

The extensive Use, and indeed Necessity, of Blood-letting in the Cure of Disorders, are Circumstances of which the Medical World, in general, has ever been sufficiently convinc'd. But, however well agreed Practitioners have been, with respect to its Usefulness, in general, we find they have been greatly divided in their Opinions, concerning the Restrictions to which its Administration ought to be confin'd in several Disorders: Among the many Points relating to this efficacious Remedy, that have been Matter of Debate, no one has given Occasion to such remarkable Disputes, as that of the Election of Blood-Vessels: Nay to such excessive Lengths, and with such extream Virulence were these at one Time carried on, that nothing but the Interposition of the Royal Authority could silence the Disputants. That the immediate Effects of Blood-letting are, either to determine this Fluid in greater Quantity on,

or

or to deplete the Vessels adjacent to, the Orifice, is, I think, self-evident ; one or the other of these must be its immediate Consequence, and there can absolutely be no (c) Medium between the two ; but the former, indeed, of these Effects have been generally ascrib'd to it : This, we find, has been the most universally prevailing Opinion, though surely it appears, as well from the Ancient as the Modern Practice, with Regard to this Remedy, to have been ever attended with a strong Suspicion of its contrary Effects. However this be, it must be confess'd, the ordinary Practice in this particular is by no Means conformable to either of these Opinions, but on the contrary directly repugnant to both ; if the first Opinion be true, bleeding at a Distance (I speak of painful Inflammatory Cases, &c.) surely is right, and opening a Vessel adjacent to the affected Part, even after the other has been premis'd, as is the ordinary Method,

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is

(c) Some, indeed, observing the continual Dissentions among the Professors of Medicine on this Subject, have ventured to affirm, that it is a Matter of great Indifference, from what Vessel Blood be drawn in any Disorder ; but this surely is as ridiculous, as it would be to declare, that in Erysipelatose, Hydropical Swellings, &c. scarifying on the Parts affected, is of no more Service than scarifying at a Distance ; or that all Evacuations are beneficial in this Respect only, that they exhaust or empty the Blood-Vessels in general, than which nothing can be more directly contrary to the Occurrences that daily happen in the Cure of Diseases.

is as certainly wrong, and can serve no other Purpose, than that of aggravating the Case : On the contrary, if the other be true, opening a Vessel near to the Part affected is right, and as long as we defer this Practice, so long we deprive our Patient of one great Advantage, which he would certainly reap from the proper Administration of this most efficacious Remedy. In fine, the manifest Inconsistency of the ordinary Method of applying Phlebotomy to the Cure of Diseases, evidently demonstrates the Subject we have been treating of, to be of more Consequence to the Practice of Medicine, than many may, perhaps, at first Thought imagine ; and, indeed, this Point so much the more necessarily requires to be determin'd, as we would wish to avoid the Imputation of proceeding on uncertain Principles in the Use of a Remedy, which we have daily, nay hourly, Occasion to apply : It was a Concern at seeing the Practice of Medicine in this Point so deficient, and I fear I may say, absurd and irrational, that induc'd me to pen the preceding Pages. How far they will tend towards rendering it more rational, I leave to the Determination of the Publick. The Nature of the Subject was such as oblig'd me to adhere to one or the other of the above Opinions, and I necessarily pitch'd on that, which to me ever seem'd the most rational : If I have been too hasty in drawing Conclusions, I beg it may not be imputed to an invincible Prejudice

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in its Behalf; since I am by no Means so tenacious in this, nor indeed in any other Point, but I am ready to relinquish them, when properly convinc'd of my Error, and shall be equally pleas'd to see this particular Point of Practice establish'd on any other Principles, provided they be founded on the solid Basis of sound Reason and Argument.

F I N I S.



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